

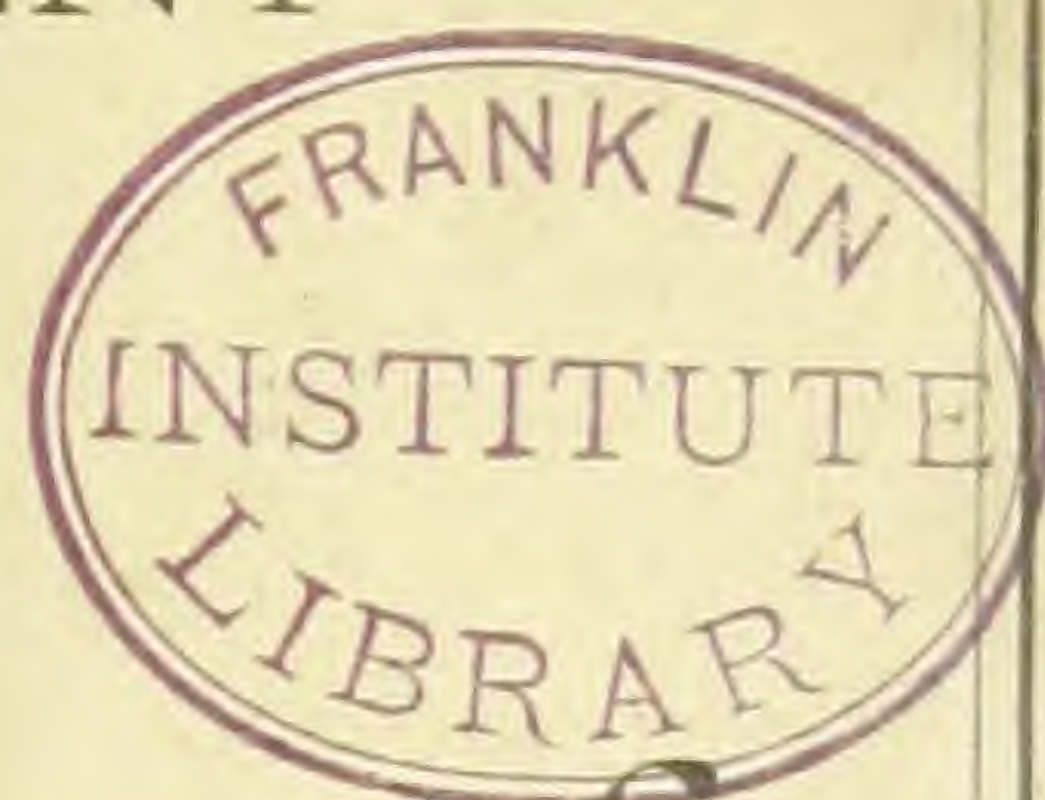
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FIRE-PROOF CONSTRUCTION.

GILBERT'S PATENT

CORRUGATED IRON



# Mansard Roof AND CEILING;

—ALSO—

Gilbert's Patent Corrugated Iron Arched Ceiling.

GILBERT, SAWYER & CO.,

PROPRIETORS.

OFFICE, No. 78 MONROE STREET,

American Express Company's Building,

CHICAGO.

1874.



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TO ARCHITECTS AND BUILDERS.

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Office of  
**Gilbert, Sawyer & Co.,**  
AMERICAN EXP. CO.'S BUILDING,  
78 Monroe St.,

CHICAGO, April 24, 1874.

*We herewith present you with a pamphlet containing a description of our method of constructing*

***CORRUGATED IRON***

**Mansard Roofs and Ceilings.**

*We are prepared to submit bids, and make contracts for constructing buildings on this system; also, to sell rights and grant privileges to make and use, under Royalty.*

*We shall be pleased to give you any further information on the subject.*

*Yours respectfully,*

GILBERT, SAWYER & CO.

JOSEPH GILBERT.

SAMUEL W. SAWYER.







# Fire-Proof Construction.

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— G I L B E R T ' S —

## Patent Corrugated Iron Mansard Roof and Ceiling,

FOR RENDERING BUILDINGS FIRE-PROOF.

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In calling public attention to a new and cheaper method of fire-proof construction than any heretofore in use, it would seem almost superfluous to urge the importance of more substantial buildings, especially since we have had so many impressive lessons on this subject, in the late disastrous fires East and West. But these conflagrations have come with such severity, that their lesson has, in some instances, been lost sight of, under the impression that there can be no such thing as a fire-proof building. Because certain structures of this class have gone down before the intense heat of sweeping fires, their faults of construction are ignored, and the conclusion jumped at that no improved system of building will avail to prevent the spreading of a fire, when once under way. Hence, the absurd idea that wooden columns are just as good as iron, and that we may as well stick to tar-and-gravel roofs, trusting in Providence and the fire department.

Now the truth is, that the chances of fire to which any building is exposed, are ten to one from inside fires; and of those that do burn from outside exposure, the vast majority of cases





arise solely from an imperfect construction of the roof. This danger is especially aggravated by the present tendency to high buildings, the roofs and upper stories of which are beyond the reach of ordinary fire-engines. Money is lavished without stint upon magnificent stone fronts, and elegant inside finish for our business blocks; economy is not thought of until the roof is reached, and then, for the purpose of saving a few hundred dollars, a weak spot is left,—as in the heel of Achilles' armor,—through which the flaming darts of the enemy are sure to enter, whenever a conflagration takes place.

A fire-proof building, in a practical sense, is not one that will stand every possible combination of circumstances tending to its destruction by fire; it is simply a structure able to withstand all ordinary exposure from without, and to confine any inside fire to the room in which it originates, until the aid of citizens and the fire department can be made available. With the prompt system of reporting alarms, and the efficient fire service of our large cities, this is practical immunity from danger. If a fire can be kept from spreading during the first half hour, it is likely to be extinguished with comparatively little damage. It is the sheerest folly to give up all effort toward checking fires by a more perfect system of construction, simply because, once in a hundred years, perhaps, a city may be exposed to a Chicago conflagration, that shall sweep all before it; but even against such danger, that city would be comparatively safe, in which the construction of fire-proof buildings had become general.

Our Western cities are far behind the East, and Eastern cities, themselves, still more in the rear of European capitals, on this matter of fire-proof construction. There, a fire rarely gets beyond the apartment in which it originates, and conflagrations de-



vastating a whole city are never heard of; yet, their fire departments are quite insignificant, compared with ours. It may be replied to this, that the complete system of fire-proof buildings in European cities is the result of rigid laws, strictly enforced. But, the first step toward such a system on this side of the Atlantic, is its voluntary adoption by the more wealthy and intelligent builders. There can be no legal enforcement of fire-proof construction while leading citizens neglect to set the example, in their own building operations. Every landlord, therefore, who puts up a fire-proof building, can have the satisfaction of knowing that he has not only acted wisely in his own interest, but that he has also hastened, rather than retarded, the time when a much needed reform can be brought about in his own city.

As a question of economy, in the long run, the advantages of fire-proof buildings are so evident that they need not be here stated at length. The great reduction in cost of insurance, both on the building and its contents; the higher rents to be obtained; the more complete security for papers and records, even when safes and vaults are used; and, in case of fire, the great advantage of partial loss over total destruction of property, resulting in loss of trade, breaking up of business, and waste of time required in building it up again; the loss of rentals, while rebuilding; the depreciation of real estate, in case of a disastrous fire, occasioned by trade being compelled to seek other localities; all these, and many other items, are to be taken into account in estimating the economy of fire-proof structures over the recklessly extravagant system of building, now prevalent in the West.

The difference in cost, however, between these two systems of construction has been greatly diminished by the inventive genius of recent times. Mr. Joseph Gilbert, of Chicago, the senior mem-





ber of our firm, a practical builder of long experience, has made this subject the chief study of his life. In 1867 he invented and patented the

## Corrugated Iron Arched Ceiling,

for rendering buildings fire-proof, whereby the average cost of the old system of brick arches is reduced; the weight of ceilings, and the total load which the foundations have to carry is greatly decreased; the operations of building simplified and facilitated.

This system has received the unqualified approval of our leading architects and builders, and has been adopted in many notable buildings throughout the United States. It is also very favorably received across the ocean, and has been already adopted in many buildings in Great Britain, and on the continent.

The chief difficulty in the way of a general adoption of fire-proof construction, is the largely increased expense of the old systems. There seems to be a demand for some cheaper method, in which the economy of timber for joists, rafters, floors, and the general finish of a building can be combined with some means of isolating the different compartments, and protecting the roof so as to make the structure practically fire-proof. Recognizing this demand, Mr. Gilbert has invented and secured by letters patent, the

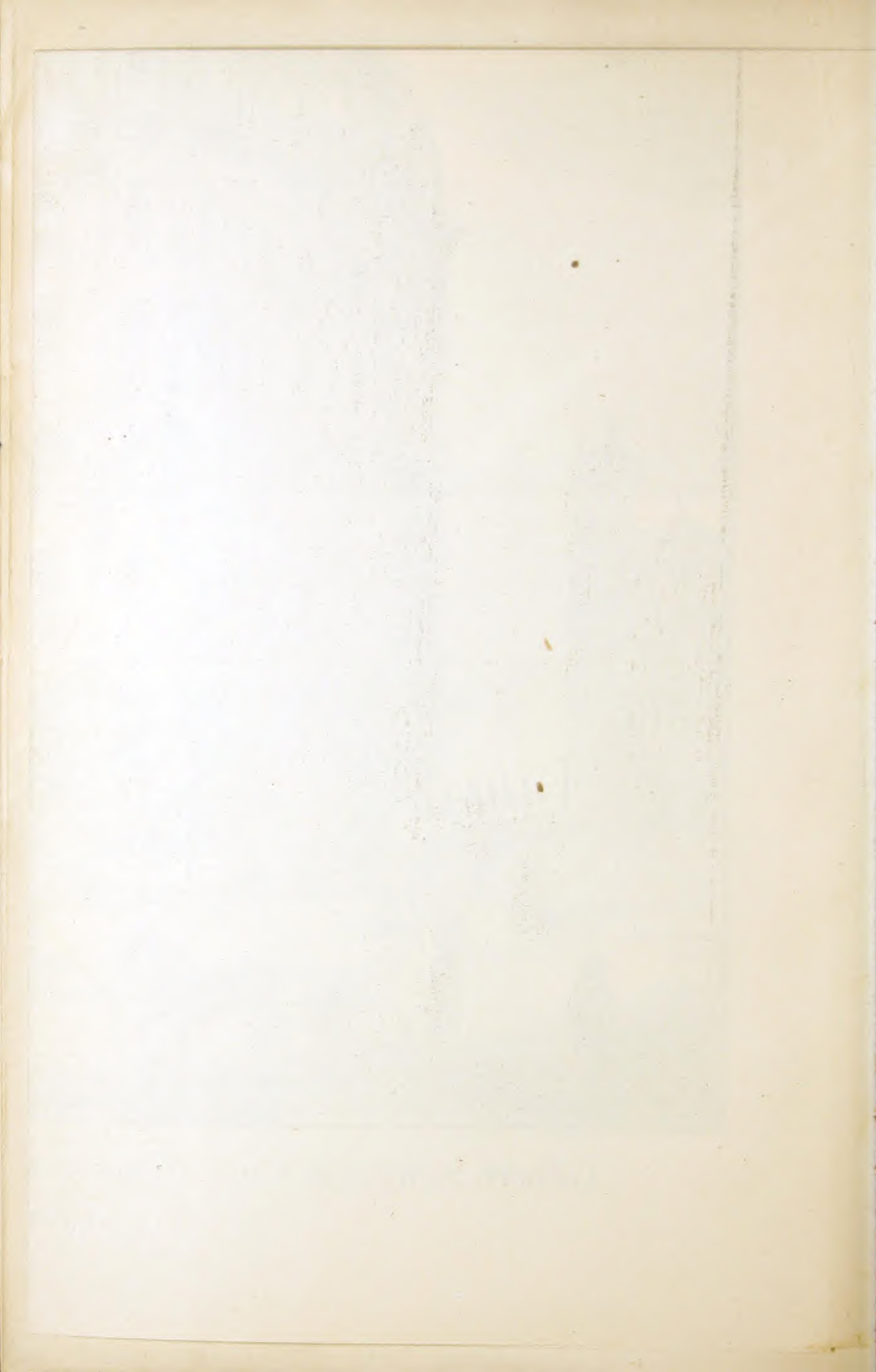
## Corrugated Iron Mansard Roof & Ceiling.

The architectural beauty and picturesqueness of Mansard Roofs had made them deservedly popular throughout the country, but after the Boston conflagration the cry of "fire traps" seemed











likely to banish them from everything but Government buildings, and other expensive and thoroughly fire-proof structures. Under Mr. Gilbert's new system, however, this crowning beauty for a large building can be retained at but slight additional expense, and made practically secure against fire. Floors and ceilings can also be constructed on the same principle, thus combining the cheapness of a timber frame work with the advantages of fire-proof construction throughout the building.

This method of construction is not confined to Mansards. Its advantages are equally applicable to common flat roofs, where the additional cost of thoroughly protecting the building from outside exposure, would be very little more than for a common tar and gravel roof.

It can also be advantageously used on small buildings, as well as large. For brick cottages and residence blocks, its superiority will be at once apparent.





## DESCRIPTION.

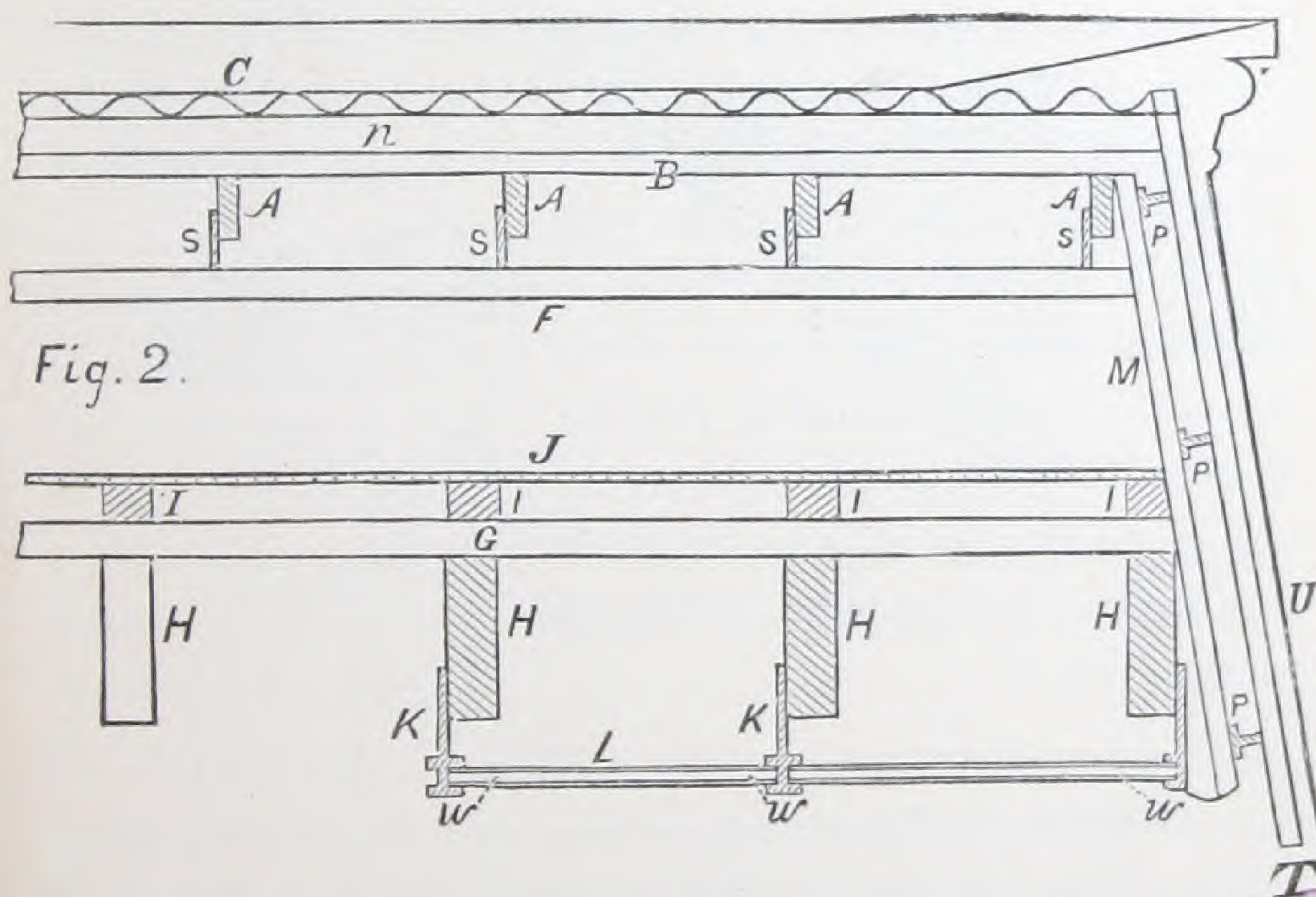
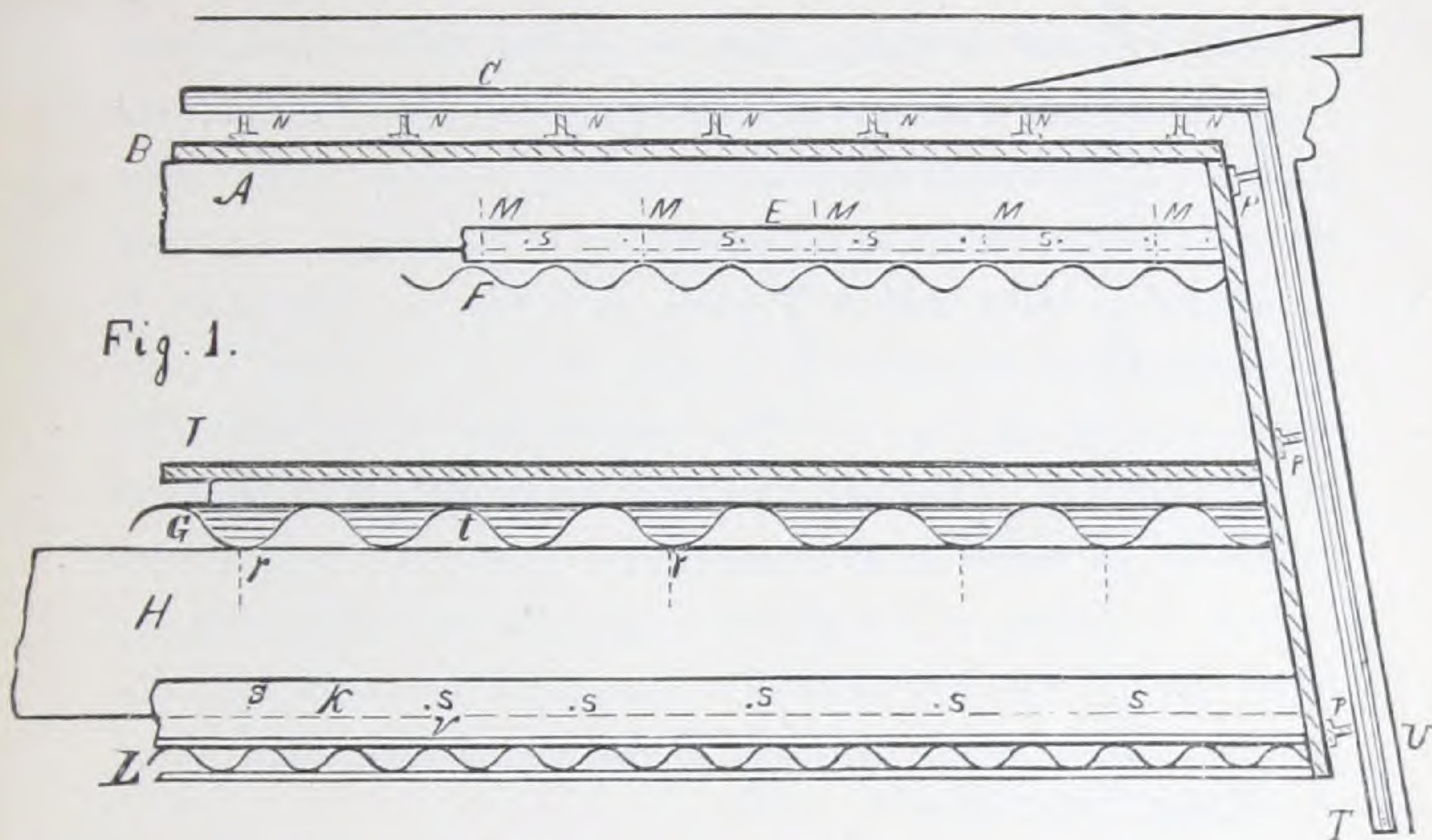
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This invention (patented in March, 1873, and March 10, 1874,) consists in suspending from joists or rafters, a metallic ceiling, which is suitably insulated from the wood-work by **T**-irons, or irons of other suitable form ; in laying upon joists, previous to laying the floor, a suitable metal covering, which is corrugated, or otherwise formed, to give it strength, so as to receive a coating of cement or other fire-proof substance preparatory to laying the floor-strips ; and in covering Mansard and other roofs with suitably formed metal plates, insulated from the rafters or roofing materials by **T**-plates, or other suitable irons, as the whole is hereinafter fully described and shown.

In the drawings, Figures 1 and 2 represent two broken sections of a Mansard roof, taken transversely to each other ; and Fig. 3, a horizontal section of one corner of the Mansard roof, showing how the metal plates are held to the wood-work.

The ceiling and floor are made as follows : H, Figs. 1 and 2, represent the ordinary wooden joists of a building, to which are rigidly fastened **T**-irons, K, running lengthwise of the joists. In the grooves, W, in the lower ends of these irons, are placed corrugated sheet-metal plates, L, extending over the entire ceiling, and overlapping each other at the joints, so as to form a neat and perfect finish. Above, and on top of the joists, is fastened a corrugated sheathing, G, which serves the purpose of a floor when the building is erecting.







The upper corrugations of sheathing, G, are filled with any suitable fire-proof substance, such as mortar, after which floor-strips, I, are laid thereon to hold flooring, J, in place, in the usual manner. F represents a corrugated ceiling, in every respect fully the same as that shown at L, except that it is nailed to the rafter A, instead of being held in **T**-irons, as in Fig. 2. The plate, F is insulated from the rafter by a strip of iron, S, nailed to the rafter, as shown in Fig. 1. This construction is an equivalent for the ceiling L. The principal roof, C, is supported above the rafters, B, by means of **T** or angle-irons *n*, and is corrugated the same as the ceiling, and is placed so far above the rafters that the latter can not take fire unless the corrugated plates are first destroyed. T represents the plates of corrugated iron, which cover the Mansard portion of the roof.

The means for fastening the plates consist of any suitable number of **T**-irons, P, which are fastened to the rafters, M, by nails or other means, such as screws or bolts; the outer ends of the **T**-irons being fastened to the roofing, T, by screws or straps of iron, as most convenient. The corners of the Mansard roof, T, are held in place by **T**-irons, X, Fig 3, and, to form a suitable corner-finish, a pilaster, U, which may be ornamental or plain, is fastened to the plates, T.

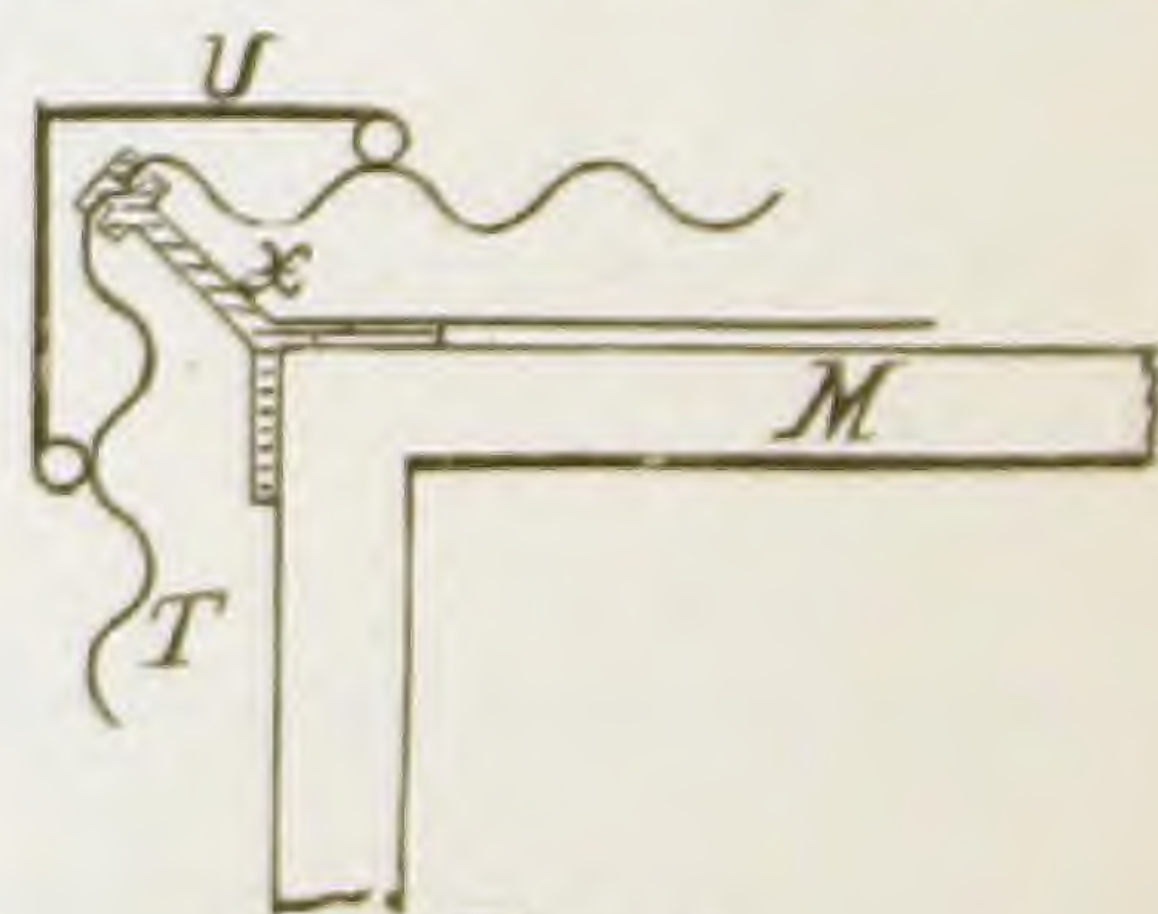


Fig. 3.

The corrugated plates may be also used for covering partitions, girders, columns, or other parts of a building, and prove equally valuable as against fire.



Fig. 4 (drawn to a larger scale), illustrates the **T**-iron used in this system of construction, showing the new arrangement for holding the sheets, used in the ceilings and at angles, in a cast-iron jaw firmly fastened to the frame.

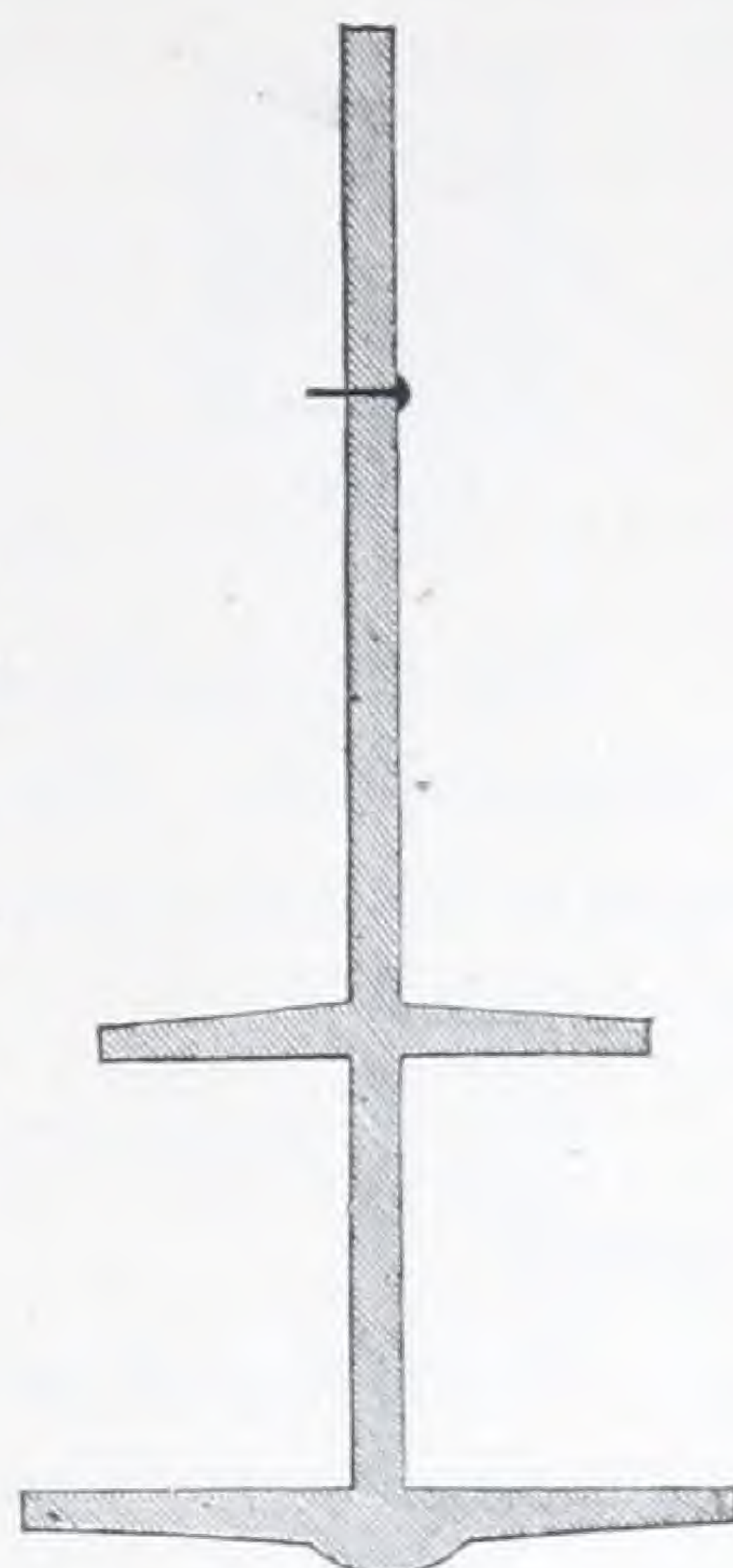


Fig. 4.

Fig. 5 shows the form of angle-irons used for fastening the corrugated sheets to Mansard roofs ; also, the method of nailing the angle-iron to the rafters, and of riveting the sheets to the iron. It will be noticed that the expense of sheathing the roof is saved, since the angle-iron can be attached directly to the rafters.

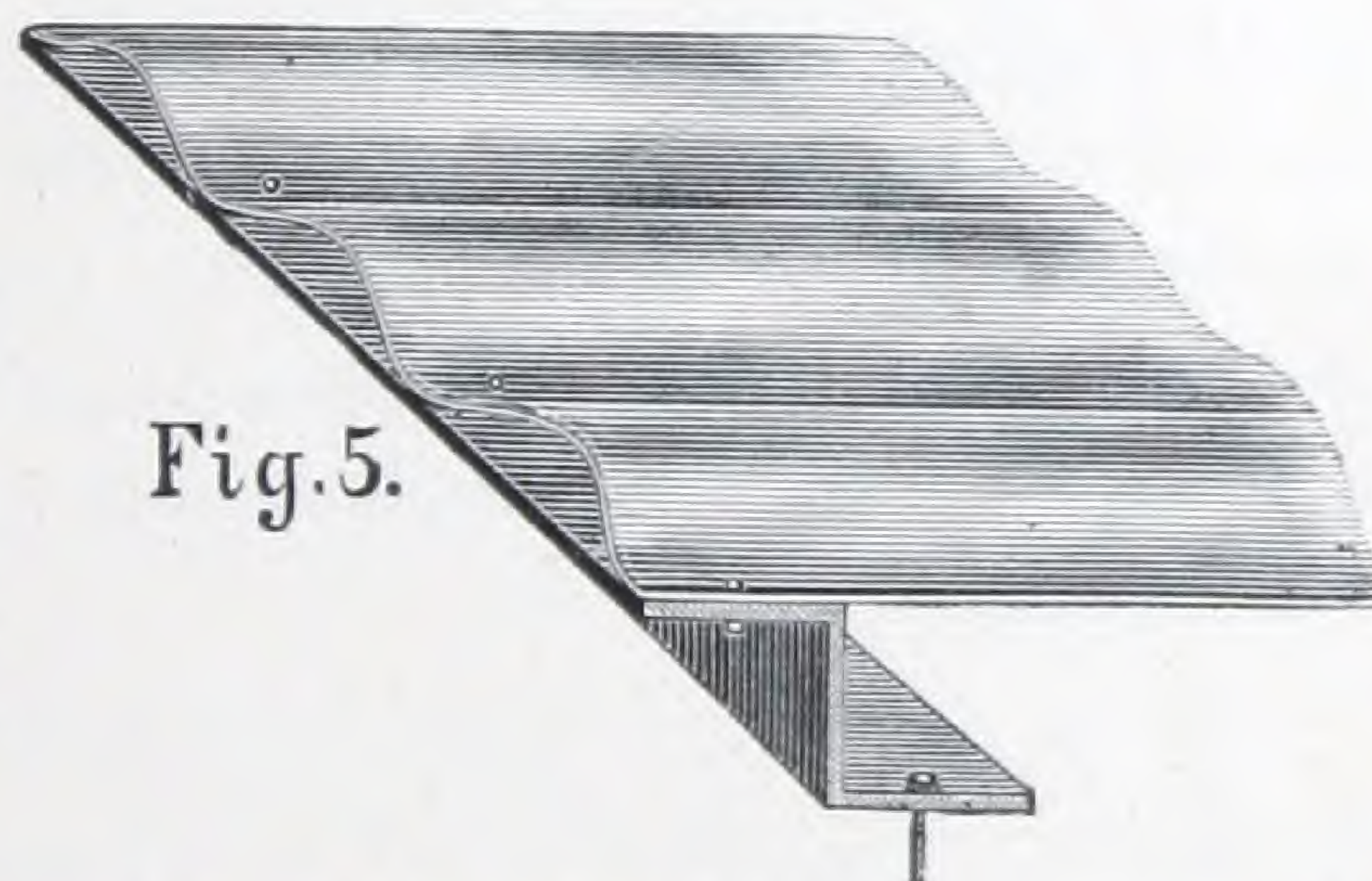


Fig. 5.

During rain storms, each corrugation acts as a gutter for the space it covers, preventing water from being driven by the wind against the dormer window casings—a frequent cause of leakage on slate or plain roofs.





Fig. 6.



Fig. 7.

Fig. 6 shows the method of insulating wooden girders with corrugated iron. The principle of fastening the corrugated plates, so as to leave an air space between the wood and iron, is the same as described above.

Fig. 7 represents a wooden column, treated in a similar manner.

This system of protection, particularly in case of girders, is very important. The usual construction of double stores, in business blocks, is to have a large centre girder running transversely through the building, supported at each floor by iron or wooden columns. In case of fire, this girder is often burned before the fire reaches the other compartments. Many buildings are thus ruined that might have been saved with comparatively little damage, had the girders been properly protected. This can be done, and a handsome finish secured, by means of the corrugated iron sheets.

Wooden partitions in fire-proof buildings can also be constructed on this system, as well as ceilings, floors, and roof, thus rendering the whole structure secure against fire.

For railway depots, warehouses, sheds, round-house roofs, and for elevators, this system of construction is particularly appropriate and valuable. Light buildings need consist only of a frame work covered with corrugated plates. The cost of such structures would be increased only about 10 per cent. over common wooden buildings; nor would the ratio of expense be much



increased for the better class of structures with corrugated iron ceilings, partitions and our system of roofs, rendering them thoroughly fire-proof. This is an important consideration in small towns, where railway buildings are exposed to fires from wooden buildings surrounding them. The superiority and economy of corrugated iron for covering wooden elevators, will be seen at a glance.

GILBERT, SAWYER & CO.,

*American Express Co.'s Building,*

78 Monroe St, Chicago.

The importance of making hotels fire-proof is not generally appreciated. The traveling public are sensitive to danger from fire, and will be certain to bestow their patronage where they are properly protected. The Palmer House is the only one in this city built on fire-proof principles. It has been full since the opening, many parties leaving other houses and going to the Palmer, on account of its safe construction. Gilbert's Patent Iron Arched Ceiling is used in the construction of this hotel, and we have the pleasure of printing herewith the endorsement of its proprietor :

CHICAGO, April 20, 1874.

MESSRS. GILBERT, SAWYER & CO., Chicago :

*Gentlemen*—In the construction of my new hotel building, I had occasion to practically test all kinds of fire-proof construction known to builders' in this city, including your patent ceiling. My judgment is, that for real economy, efficiency, and durability, your Corrugated Iron Arched Ceiling stands at the head of the list.

Very respectfully yours,

POTTER PALMER.

CHICAGO, April 16, 1874.

GILBERT, SAWYER & CO., 78 Monroe St., Chicago :

*Gentlemen*.—It affords me pleasure to inform you that my Hotel Building, at the corner of Adams and Dearborn streets, is now completed, being constructed with your Patent Corrugated Iron Mansard Roof. I cheerfully recommend your Patent to all who desire a thoroughly Fire Proof Building.

Respectfully yours, etc.,

H. H. HONORE.



*(From the Chicago Land Owner.)*

#### FIRE-PROOF BUILDINGS.—A NEW MANSARD ROOF.

After having tried all sorts of experiments to obtain fire-proof buildings at a moderate cost, our architects and business men will learn with pleasure that there is now on exhibition, at the office of Messrs. Gilbert, Sawyer & Co., in the new American Express building, a model for Mansard roofs, floors, and ceilings, which meets exactly the desired point of safety from the flames. This device is the invention of Joseph Gilbert, Esq., the well-known patentee of the celebrated corrugated iron arch ceiling for fire-proof buildings. The material employed is the familiar corrugated iron in sheets, and the specialty is its mode of attachment to the Mansard front and roof, and to ceiling and floor-beams, by being riveted to T-iron strips, fastened laterally upon the frame-work. The latter may be either of wood or iron, but by this principle the former is made entirely safe, with much economy, by the intervention of an air-chamber throughout the whole surface. The new arrangement for receiving and holding the sheets, used in the ceilings and at angles in a cast-iron jaw, firmly fastened to the frame as before, is a principle that will everywhere commend itself in respect to economy and perfect safety.

Our citizens interested in this substantial method of construction, will do well to examine it on the Honore Hotel, corner Adams and Dearborn streets, where it is used exclusively, and to which the inventor may indeed point with pride, as, besides its essential fire-proof qualities, it is one of the handsomest Mansards ever erected in the country. After having examined all the inventions offered for roofs, Mr. Honore, himself a man of large experience in building, adopted this in preference to all others. Parties about to build should not fail, in any event, to call at Gilbert, Sawyer & Co.'s office, and examine this great improvement.



*From the Chicago Tribune, June 7, 1874.*

### MEETING OF ARCHITECTS.

At a meeting of the Architects of Chicago, at the office of Gilbert, Sawyer & Co., Thursday, June 4th, Mr. Wm. W. Boyington was elected Chairman, and Mr. J. C. Cochrane Secretary.

The object of the meeting was to examine the new method of application of Mr. Gilbert's patent for Corrugated Ceiling, Roofs, etc.

Mr. Cochrane presented the following paper, expressing his views on the merits of the same, which was adopted:

"We, the undersigned, Architects of Chicago, having examined Gilbert's patent Corrugated Iron, as applied to roofs, ceilings, floors, partitions, coverings for girders (both for iron and wood) and columns, would state that we consider the use of this material, as applied by Mr. Gilbert's patent, of intrinsic value; not as making a building actually fire-proof, but sufficiently so, as to check fire in its incipient stage, thereby making it of great value, which, in fact, (as has been demonstrated in European cities,) is the chief requisite for the protection of large cities against fire, and we would further state as one of the reasons we recommend its use, is on account of its comparative cheapness, coming as it does within the means of those who are erecting buildings of moderate cost, for we find that for ceilings, the cost is but little in excess of wood as ordinarily applied to storerooms; and we would further state that the rates of insurance on buildings properly protected by this corrugated iron would be so diminished as to more than compensate for the extra cost of the iron. This alone seems to us sufficient inducement to adopt it for stores and warehouses particularly."

G. P. RANDALL.  
WM. W. BOYINGTON.  
O. L. WHELOCK.  
C. P. THOMAS.  
OTTO H. MATZ.  
A. SAELTZER.  
J. C. COCHRANE.  
THOMAS TILLEY.  
C. C. MILLER.  
E. S. JENNISON.  
W. L. CARROLL.  
G. B. DIXON.  
G. H. COLBROOK.  
J. C. RANKIN.

E. BURLING.  
D. ADLER.  
J. M. VAN OSDEL, Jr.  
THEO. KARLS.  
WM. H. WILCOX.  
S. V. SHIPMAN.  
ASHER CARTER.  
D. J. WILLIAMS.  
H. G. HOWE.  
H. REHWOLDT.  
A. & E. BAUMAN.  
ADAM L. ROBE.  
ALEX. KIRKLAND.



